CLAIMS

1. An acknowledgement method in a wireless communication system, comprising:

receiving a reverse link traffic channel data frame;

transmitting an acknowledgement (ACK) signal if quality of the received data frame is indicated as being good; and

transmitting a negative acknowledgement (NAK) signal only if the received data frame is indicated as being bad but has enough energy such that, if combined with energy from retransmission of the data frame, it would be sufficient to permit correct decoding of the data frame.

2. The method of claim 1, wherein the reverse link traffic channel is a reverse supplemental channel (R-SCH).

3. The method of claim 1, further comprising:

determining the quality of the received data frame.

4. The method of claim 3, wherein determining the quality of the received data frame includes indicating the quality of the frame as being good when a reverse link pilot signal has sufficient energy to permit correct decoding of the frame.

5. The method of claim 1, further comprising:

transmitting a traffic-to-pilot ratio (T/P) delta value along with the NAK signal.

6. The method of claim 5, further comprising:

adjusting an energy level of the data frame using the T/P delta.

7. The method of claim 6, further comprising:

retransmitting the adjusted data frame if the NAK signal is indicated.

8. The method of claim 1, wherein receiving and transmitting are performed by a secondary base station.

9. A method in a wireless communication system, comprising:

transmitting a reverse link traffic channel data frame;

receiving an acknowledgement (ACK) signal if quality of the transmitted data frame is indicated as being good; and

receiving a negative acknowledgement (NAK) signal only if the transmitted data frame is indicated as being bad but has enough energy such that, if combined with energy from retransmission of the data frame, it would be sufficient to permit correct decoding of the data frame.

10. The method of claim 9, wherein transmitting and receiving are performed by a remote terminal.

11. An acknowledgement method in a wireless communication system, comprising:

receiving a reverse supplemental channel (R-SCH) data frame;

transmitting a negative acknowledgement (NAK) signal if quality of the received R-SCH data frame is indicated as being bad; and

enabling a remote terminal to recognize an absence of acknowledgement as an acknowledgement (ACK) signal to indicate that the quality of the received R-SCH frame is good.

12. The method of claim 11, wherein the acknowledgement method is performed by a best base station.

13. The method of claim 12, further comprising:

transmitting an acknowledgement (ACK) signal to the remote terminal when there is a conflict between the remote terminal and the best base station as to which base station is the best base station.

14. The method of claim 11, further comprising:

determining the quality of the received R-SCH frame.

15. The method of claim 14, wherein determining the quality of the received R-SCH frame includes indicating the quality of the frame as being bad when energy of the R-SCH frame, combined with retransmission energy, would be insufficient to permit correct decoding of the frame.

16. The method of claim 11, wherein transmitting a NAK signal includes transmitting a traffic-to-pilot ratio (T/P) delta if the received R-SCH frame has enough energy such that, if combined with energy from retransmission of the R-SCH frame, it would be sufficient to permit correct decoding of the frame.

17. The method of claim 16, further comprising:

adjusting an energy level of the R-SCH frame using the T/P delta.

18. The method of claim 17, further comprising:

retransmitting the adjusted R-SCH frame if the NAK signal is received.

19. A wireless communication system operating an acknowledgement channel, comprising:

a base device configured to receive a reverse supplemental channel (R-SCH) frame, the base device operating to transmit an acknowledgement (ACK) signal if quality of the received R-SCH frame is indicated as being good; and

a remote device configured to transmit the R-SCH frame to the base device, the remote device operating to receive the ACK signal, and to recognize an absence of acknowledgement as a negative acknowledgement (NAK) signal to indicate that the quality of the received R-SCH frame is bad.

20. The apparatus of claim 19, wherein the base device includes a quality determination element configured to determine the quality of the received R-SCH frame.

21. The apparatus of claim 19, wherein the base device includes a power controller configured to compute and transmit the NAK signal with a T/P delta if the received R-SCH frame has enough energy such that, if combined with energy from retransmission of the R-SCH frame, it would be sufficient to permit correct decoding of the frame.

22. The apparatus of claim 21, wherein the remote device includes an energy level adjuster configured to adjust an energy level of the R-SCH frame using the received T/P delta, and to retransmit the R-SCH frame to the base device.

23. The apparatus of claim 19, wherein the base device is a secondary base device.

24. A wireless communication system having a forward link acknowledgement channel, comprising:

a base device configured to receive a reverse supplemental channel (R-SCH) frame, the base device operating to transmit a negative acknowledgement (NAK) signal if quality of the received R-SCH frame is indicated as being bad; and

a remote device configured to transmit the R-SCH frame to the base device, the remote device operating to receive the NAK signal, and to recognize an absence of acknowledgement as an acknowledgement (ACK) signal to indicate that the quality of the received R-SCH frame is good.

25. The apparatus of claim 24, wherein the base device includes a quality determination element configured to determine the quality of the received R-SCH frame.

26. The apparatus of claim 24, wherein the base device includes a power controller configured to compute and transmit the NAK signal with a T/P delta if the quality of the received R-SCH frame is bad but has enough energy such that, if combined with energy from retransmission of the R-SCH frame, it would be sufficient to permit correct decoding of the frame.

27. The apparatus of claim 24, wherein the base device is a best base device having a smallest path loss to the remote device.

28. A base station for a wireless communication system, the base station comprising:

an RF front end configured to receive and appropriately amplify, filter, and process a reverse supplemental channel (R-SCH) frame from a remote terminal or remote terminals; and

a digital signal processor (DSP) adapted to demodulate and further process the received R-SCH frame, the DSP configured to direct the RF front end to transmit an acknowledgement (ACK) signal if quality of the received R-SCH frame is indicated as being good, the DSP configured to direct the RF front end to transmit a negative acknowledgement (NAK) signal only if the received data frame is indicated as being bad but has enough energy such that, if combined with energy from retransmission of the data frame, it would be sufficient to permit correct decoding of the data frame.

29. The base station of claim 28, wherein the DSP includes a quality determination element configured to determine the quality of the received R-SCH frame.

30. The base station of claim 28, wherein the DSP includes a power controller configured to compute and direct the RF front end to transmit the NAK signal with the T/P delta to the remote terminal if the received R-SCH frame has enough energy such that, if combined with energy from retransmission of the R-SCH frame, it would be sufficient to permit correct decoding of the frame.

31. The base station of claim 28, wherein the base station is a secondary base station.

32. A base station for a wireless communication system, the base station comprising:

an RF front end configured to receive and appropriately amplify, filter, and process a reverse supplemental channel (R-SCH) frame from a remote terminal or remote terminals; and

a digital signal processor (DSP) adapted to demodulate and further process the received R-SCH frame, the DSP configured to direct the RF front end to transmit a negative acknowledgement (NAK) signal if quality of the received R-SCH frame is indicated as being bad, the DSP configured to enable the remote terminal to recognize an absence of an acknowledgement (ACK) signal as indicating acknowledgement of receipt of the R-SCH frame at the base station.

33. The base station of claim 32, wherein the base station is a best base station with a smallest path loss to the remote terminal.

34. A wireless remote terminal for a communications system, the remote terminal comprising:

an RF front end configured to transmit a reverse supplemental channel (R-SCH) frame to a base station, the RF front end configured to receive and appropriately amplify, filter, and process an acknowledgement (ACK) signal from the base station to indicate that quality of the R-SCH frame received at the base station is good, and to recognize an absence of acknowledgement as a negative acknowledgement (NAK) signal to indicate that the quality of the R-SCH frame received at the base station is bad; and

a digital signal processor (DSP) adapted to demodulate and further process the received ACK signal.

35. A wireless remote terminal for a communications system, the remote terminal comprising:

an RF front end configured to transmit a reverse supplemental channel (R-SCH) frame to a best base station, the RF front end configured to receive and appropriately amplify, filter, and process a negative acknowledgement (NAK) signal from the base station to indicate that quality of the R-SCH frame received at the base station is bad, and to recognize an absence of acknowledgement as an acknowledgement

(ACK) signal to indicate that the quality of the R-SCH frame received at the base station is good; and

a digital signal processor (DSP) adapted to demodulate and further process the received NAK signal.

36. A forward link acknowledgement channel driver for a wireless communication, the driver comprising:

a block encoder configured to receive an ACK/NAK message having at least one bit, the block encoder operating to encode the ACK/NAK message with a generator matrix to produce a codeword;

a first mapper configured to map the codeword into a first binary signal; and

a first mixer configured to mix the first binary signal with a first orthogonal spreading code.

37. The driver of claim 36, further comprising:

a delay element configured to provide a sequence delay of one frame period, the delay element configured to delay the codeword by one frame period;

a second mapper configured to map the delayed codeword into a second binary signal; and

a second mixer configured to mix the second binary signal with a second orthogonal spreading code.

38. The driver of claim 37, further comprising:

a summing element configured to sum outputs of the first and second mixer.

39. The driver of claim 38, further comprising:

a demultiplexer to demultiplex an output of the summing element to produce an ACK/NAK signal appropriate for forward link transmission.

40. The driver of claim 36, wherein the acknowledgement channel is a Forward Common Packet Acknowledgement Channel (F-CPANCH).

41. The driver of claim 36, wherein the generator matrix for a one-bit ACK/NAK is $[1\ 1\ 1\ 1\ 1\ 1]$.

42. The driver of claim 36, wherein the generator matrix for a two-bit ACK/NAK is $\begin{bmatrix} 1 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 1 \end{bmatrix}$.

43. The driver of claim 36, wherein the generator matrix for a three-bit ACK/NAK is $\begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 0 & 1 & 0 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 & 1 & 1 \end{bmatrix}$.

44. The driver of claim 36, wherein the generator matrix for a four-bit ACK/NAK is $\begin{bmatrix} 1 & 1 & 1 & 0 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 & 1 & 1 \end{bmatrix}$.

45. The driver of claim 36, wherein the orthogonal spreading code is a Walsh code.

46. A method of encoding acknowledgement channels in base stations of a wireless communication system, the method comprising:

receiving a reverse link traffic channel data frame from a remote terminal;

allowing absence of acknowledgement (ACK) signals on an acknowledgement channel of a best base station to indicate that quality of the received data frame is good;

allowing absence of negative acknowledgement (NAK) signals on acknowledgement channels of secondary base stations to indicate that quality of the received data frame is bad;

encoding the ACK signals and the NAK signals, and transmitting the encoded signals on the acknowledgement channels during a switching period.

47. The method of claim 46, wherein the switching period is configured as a duration of a soft-handoff.

48. The method of claim 46, wherein the best base station is selected based on forward link channel quality.

49. The method of claim 48, wherein the forward link channel quality includes a strongest forward link pilot signal detected by a remote terminal.

50. The method of claim 46, wherein the best base station is selected based on reverse link power control information.

51. The method of claim 50, wherein the reverse link power control information includes power control (PC) commands.

52. The method of claim 51, further comprising:

enabling the remote terminal to determine that a base station is the best base station if a difference between 'power down' and 'power up' PC commands exceeds a first threshold.

53. The method of claim 52, further comprising:

enabling a base station to determine that it is the best base station if the difference between 'power down' and 'power up' PC commands exceeds a second threshold.

54. The method of claim 53, wherein the second threshold is larger than the first threshold.

55. The method of claim 54, further comprising:

enabling a base station to determine that it is the secondary base station if the difference between 'power down' and 'power up' PC commands is below a third threshold.

56. The method of claim 55, wherein the third threshold is smaller than the first threshold.

57. The method of claim 55, further comprising:

transmitting both ACK and NAK signals explicitly if the difference between 'power down' and 'power up' PC commands is above the third threshold but is below the second threshold.